Installation Guide of Hi-Speed USB to Industrial RS-232/422/485 Adapter

Introduction of USB-COMi-M

The USB to Industrial RS-232/422/485 Adapter is designed to make industrial communication port expansion quick and simple. Connecting to a USB port on your computer or USB hub, the USB Industrial RS-232/422/485 Adapter instantly adds an industrial multi-electrical interface serial communication port to your system. By taking advantage of the USB bus, the USB Industrial I/O Adapter makes it easier than ever to add RS-232, RS-422 or RS-485 serial device to your system with easy plug-and-play and hot plug features. Adapting the new technology, the serial port expansion now takes the new bus with easy and convenient connectivity.

Plugging the USB to Industrial RS-232/422/485 Adapter to the USB port, the adapter is automatically detected and installed. There are no IRQ & COM port conflicts, since the port doesn't require any additional IRQ, DMA, memory as resources on the system. The RS-232, or RS-422/485, port functions as native Windows COM port, and it is compatible with Windows serial communication applications. Each port is individually configurable.

The USB to Industrial Serial Adapter provides instant connectivity to RS-232/422/485 communication devices for factory automation equipment, multi-drop data collection devices, barcode readers, time clocks, scales, data entry terminals, PC to PC long distance communications, ATMs and serial communication in harsh environment. The USB to Industrial I/O Adapter provides industrial solution requiring single node or multi-drop communications over short and long distance.

Specifications & Features

- **Adds a high speed RS-232/ 422 / 485 serial port via USB connection.**
- **384 byte receive buffer.**
- **128 byte transmit buffer for high speed data throughput.**
- **Requires no IRQ, DMA, I/O port.**
- **Data rates: 300 bps to 921.6K bps.**
- **Serial Connector: one DB-9 male connector, and one 6-pin Terminal Block**
- **Auto transmit buffer control for 2-wire RS-485 half-duplex operation.**
- **Termination resistors installed on-board.**
- **RS-232 data signals: DCD, RxD, TxD, DTR,GND, DSR, RTS, CTS, RI.**
- **RS-422 data signals: Tx-, Tx+, Rx+, Rx-, GND, RTS-, RTS+, CTS+, CTS-.**
- **RS-485 data signals: Tx-, Tx+, Rx+, Rx- (4 wire), and data-, data+ (2 wire).**
- **Monitor LEDs of TxD, RxD indicating port status.**
- **Supports power output of 5V, 150mA, through Pin-5 of terminal block, for external devices requiring power**
- **External 4-pin dip switch to set RS-232, RS-422, or RS-485 modes**
- **Virtual COM port drivers provided for Windows 7, Vista, 2003, XP, 2000.**

Input Power

- USB Self Power (500mA, 5V)

Output Power

- 150mA, 5V power output for external devices requiring power

Hardware Installation

Outside the unit, there is one 4-pin DIP switch which is set to select the mode of operation. You will need to set the switch settings to RS-232 mode, or RS-422, or RS-485 mode as per the requirements of your application.

The Mode Block Configuration Settings are listed as follows:

SW (External DIP Switch) for Mode Setting

	Operation Mode	S1	S2	S3	S4
RS-232	Standard RS-232 Mode	OFF	ON	ON	ON
RS-422	4 wire with Handshaking	ON	ON	ON	ON
RS-485	Full Duplex (4 wire)	ON	OFF	ON	ON
	Half Duplex (2 wire) - with Echo	ON	OFF	OFF	ON
	Half Duplex (2 wire) - without Echo	ON	OFF	OFF	OFF

JP1 for Termination and Biasing Option Configuration

Inside the unit, there is a 2 x 7 (14 pin) header blocks which are jumpered to enable Tx, Rx, CTS 120 Ohm termination resistors and Tx, Rx 750 Ohm BIASing resistor.

You will need to open up the metal case and set the jumper setting for RS-422 mode or RS-485 mode as per the requirements of your application.

Settings are listed as follows:

Jumper	Function
1-2	Tx Termination of 120 Ohm. This jumper should always be populated for RS-485 mode.
3-4	Pull-up Tx+ to VCC by 750 Ohm Bias resistor. This jumper should be populated for pull-up Tx+.
5-6	Pull-down Tx- to GND by 750 Ohm Bias resistor. This jumper should be populated for pull-down Tx- .
7-8	Rx Termination of 120 Ohm. This jumper should always be populated for RS-422 mode.
9-10	Pull-up Rx+ to VCC by 750 Ohm Bias resistor. This jumper should be populated for pull-up Rx+
11-12	Pull-down Rx- to GND by 750 Ohm Bias resistor. This jumper should be populated for pull-down Rx- .
13-14	CTS Termination of 120 Ohm. This jumper should always be populated for RS-422 mode.

Note : Sometimes, when operating in RS-422 or RS-485, it is necessary to configure termination and biasing of the data transmission lines. Generally this must be done in the cabling, since this depends on the installation of connections. Before applying the option, check your cable specification for proper impedance matching.

JP2 : Enable the +5V 150mA Power for External Device

The USB-COMi-M provides a unique feature of supplying power output of 5V/150mA through Pin-5 of terminal block to the serial device requiring power. By default, this feature is disabled. To enable the power, you need to open the metal case and set the jumper (JP2) to the position of "ON".

Jumper	Function
ON	Enable the Terminal Block Pin-5 to support a 5V 150mA power for external device requiring power
OFF	Disable the 5V 150mA power (Default)

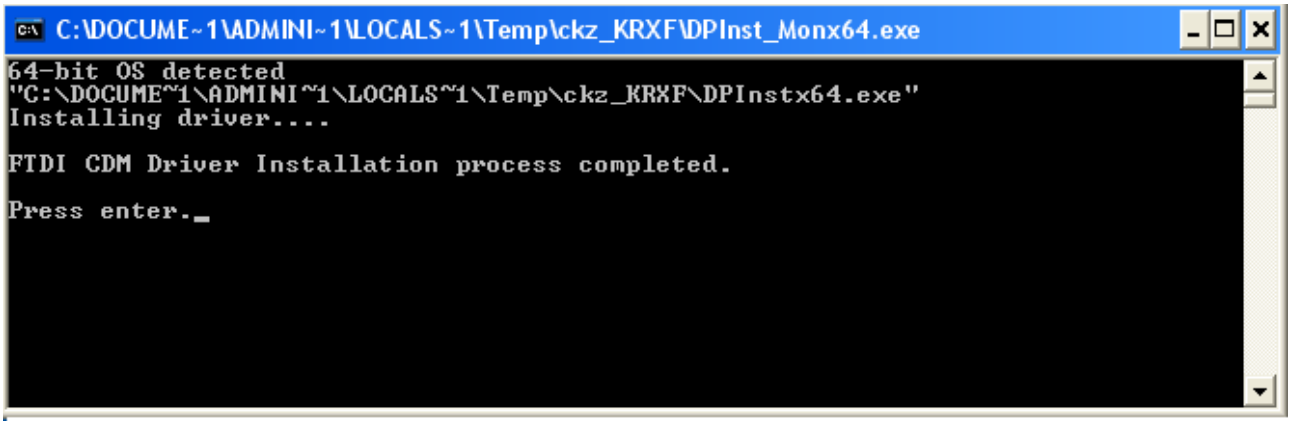
Windows 7/ Vista / 2003 / XP / 2000 Driver Installation

You need to have administrator privileges to install any new drivers under Windows 7 / Vista / 2003/ XP /2000. To install the driver or update the configuration please log onto Windows as "Administrator" or ask your system administrator to install the USB-COM driver.

You need to install driver first, prior to hardware installation. Do not connect the USB-to-Serial Adapter to the USB port of your computer, before you finish driver installation.

Please proceed with the following steps to install the driver:

1. **Insert the "USB COM Series Driver and Utility" CD into your CD-ROM.**
2. **The "USB COM Series Driver and Utility CD" dialog box appears.**
3. **Under "Driver Installation", double click "Windows 7, Vista, 2003, XP, 2000 driver" to install the device driver.**
4. **The USB COM install program will auto-detect the OS type and install the driver automatically. (Note: in Windows 7 or Vista OS you will find another dialog box, please click on "OK" to confirm the drivers install program).**



5. **After the message "FTDI CDM Driver installation process completed" appears, press "Enter" to complete the driver installation.**
6. **Plug in the USB to Serial Adapter to the USB port of your computer. Windows will finish installing the driver files.**

Check Installation

You can now verify the installation has been completed successfully by looking under Device Manager of the System Properties screen. (Go there by Start-Setting-Control Panel-System Properties-Hardware-Device Manager.

The device should have installed as a "USB Serial Port (COMx)" attached to "USB Serial Converter ".

Change COM Port Properties & COM Port Number

This feature is particularly useful for programs, such as HyperTerminal, which only work with COM1 through COM4. Please ensure that you do not change the COM Port Number already in use.

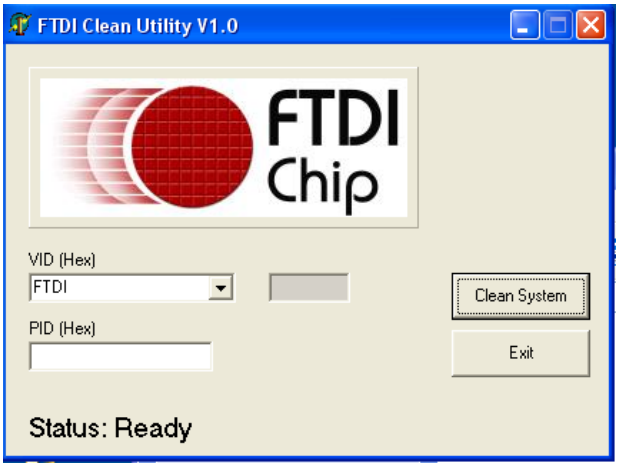
To change the virtual COM port properties:

- **Select the "USB Serial Port"**
- **Click “Properties”.**
- **Select "Port Setting" and “Advanced”.**
- **Click the drop down arrow on COM Port Number and scroll to the required COM port. Select "OK".**
- **Return to the Device Manager Screen. You will see that the USB Serial Port installation has been changed to the new COM Port Number.**

Uninstalling Windows 2003/XP/2000 Drivers

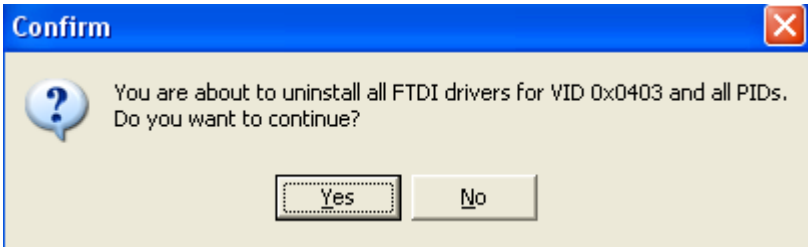
Please proceed with the following steps to uninstall the 2003/XP/2000 driver:

1. **Insert the “USB COM Series Driver and Utility” CD into your CD-ROM.**
2. **The “USB COM Series Driver and Utility CD” dialog box appears.**
3. **Under “Driver Uninstalling”, double click “Windows 2003, XP, 2000 driver uninstall” to uninstall the device driver.**
4. **When following dialog box appears, double click “Clean System” to uninstall the 2003/XP/2000 drivers.**

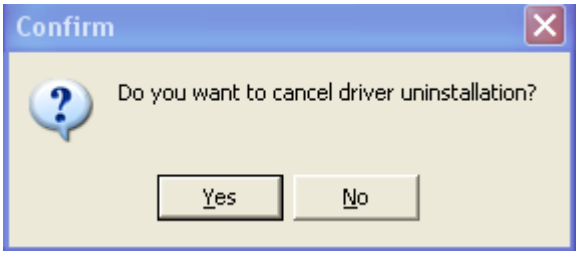


5. **You need to disconnect all USB to serial Adapters from your PC, when the message below appears. Double click “OK” to start uninstalling Windows 2003/XP/2000 USB to Serial drivers.**

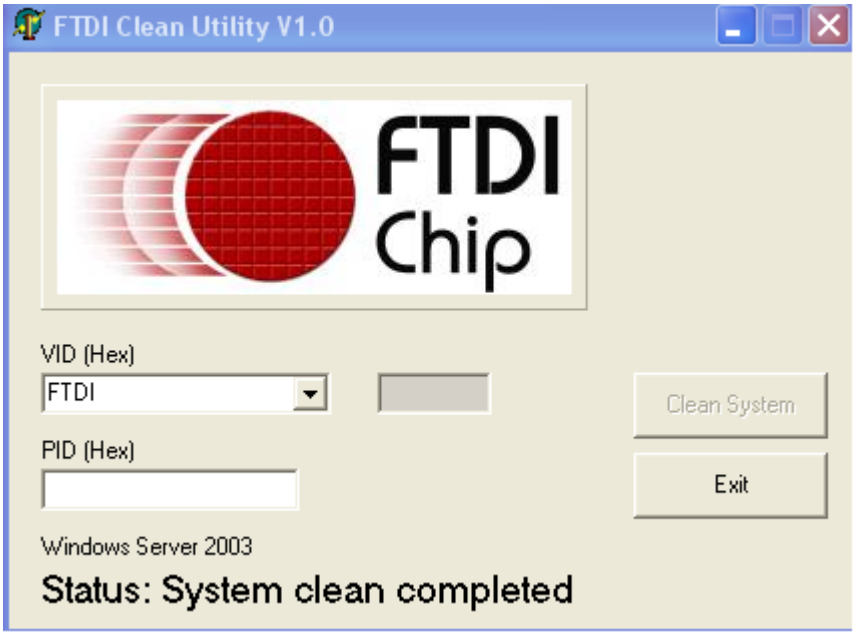
6. **Double click “Yes” to confirm it.**



7. **Click “No” to proceed.**

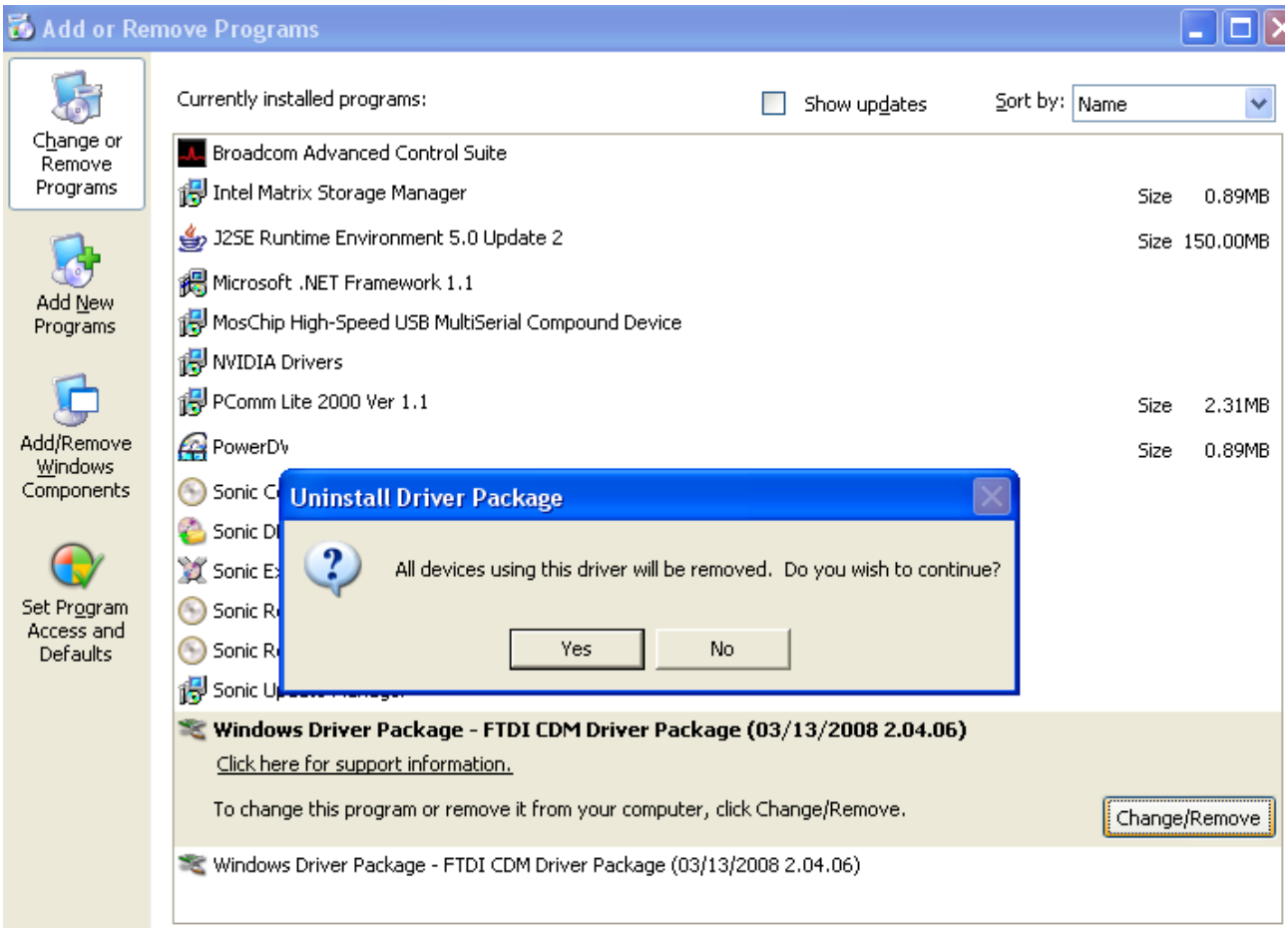


8. **When the message “Status: System clean completed” appears, double click “Exit” to complete the USB to serial drivers uninstall.**



9. **Press “Start” button and select “Control Panel”.**

10. **Open the Add or Remove program.**


Add or Remove Programs
Change or Remove Programs
Add New Programs
Add/Remove Windows Components
Set Program Access and Defaults
Currently installed programs:
Show updates
Sort by: Name
Broadcom Advanced Control Suite
Intel Matrix Storage Manager
Size 0.89MB
J2SE Runtime Environment 5.0 Update 2
Size 150.00MB
Microsoft .NET Framework 1.1
MosChip High-Speed USB MultiSerial Compound Device
NVIDIA Drivers
PComm Lite 2000 Ver 1.1
Size 2.31MB
PowerDv
Size 0.89MB
Uninstall Driver Package
All devices using this driver will be removed. Do you wish to continue?
Yes
No
Windows Driver Package - FTDI CDM Driver Package (03/13/2008 2.04.06)
Click here for support information.
To change this program or remove it from your computer, click Change/Remove.
Change/Remove
Windows Driver Package - FTDI CDM Driver Package (03/13/2008 2.04.06)

11. **Remove the first “Windows Driver Package – FTDI CDM Driver Package (…)”.**

12. **Click “Chang/Remove” and “Yes” to remove the first Windows Driver Package.**

13. **Remove the second “Windows Driver Package – FTDI CDM Driver Package (…)”.**

14. **Click “Chang/Remove” and “Yes” to remove the second Windows Driver Package.**

15. **Reboot the computer to complete the driver uninstall.**

Uninstalling Windows 7 or Vista Drivers

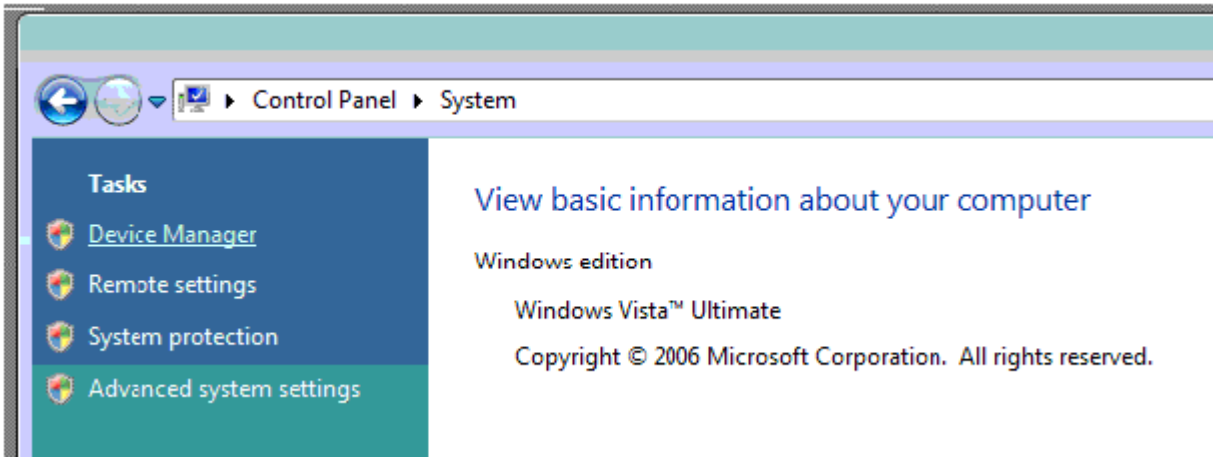
Windows 7 and Vista have many new security features. You need to proceed with the following steps to uninstall the Windows 7/Vista driver:

1. **The USB to serial devices must connect to the PC.**

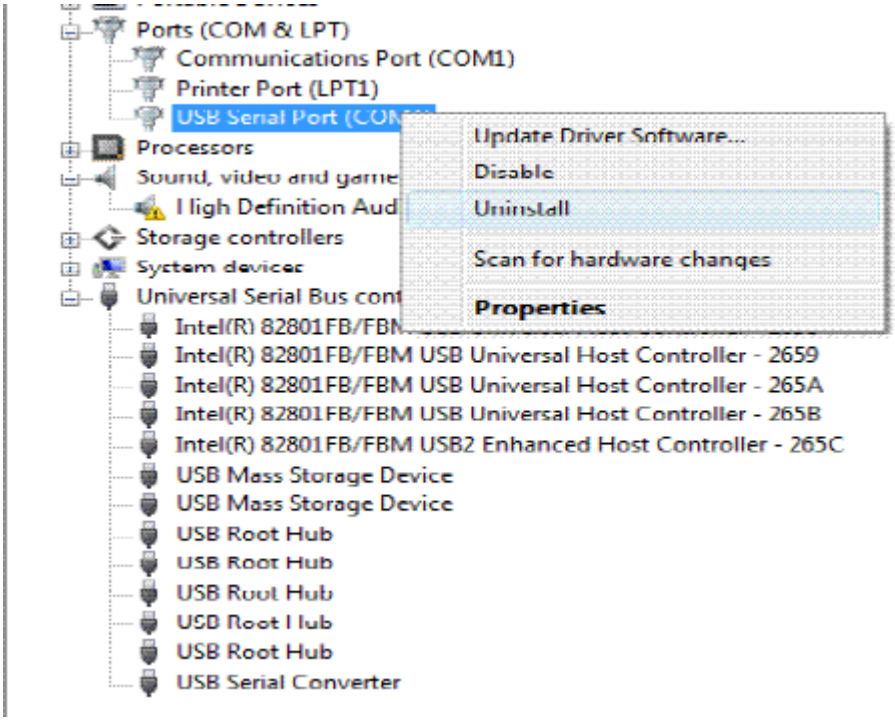
2. **Press “Start” button and select “Control Panel”.**

3. **Select “Classic View” from the top left hand corner and then “System” from the list.**

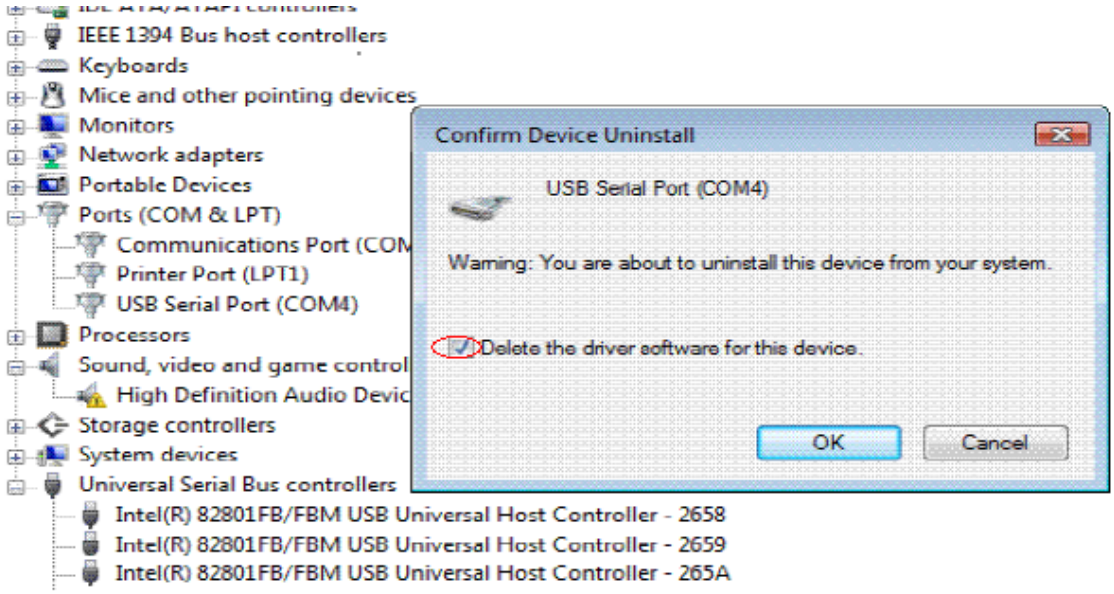
4. **Select “Device Manager” from the top left hand corner.**



5. **Locate your Device under the Ports (COM & LTP) section and right click on it to bring up the menu shown.**

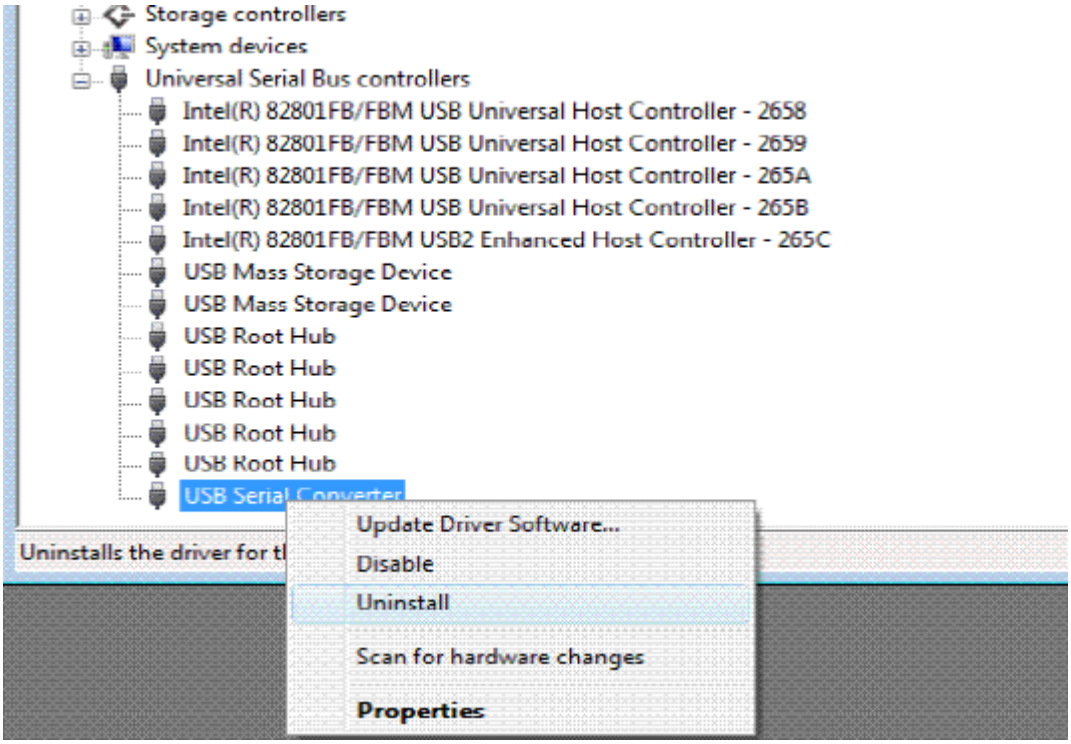


6. **Select uninstall and be sure to click the box for “Delete the driver software for this device” in the next window and press “OK”.**

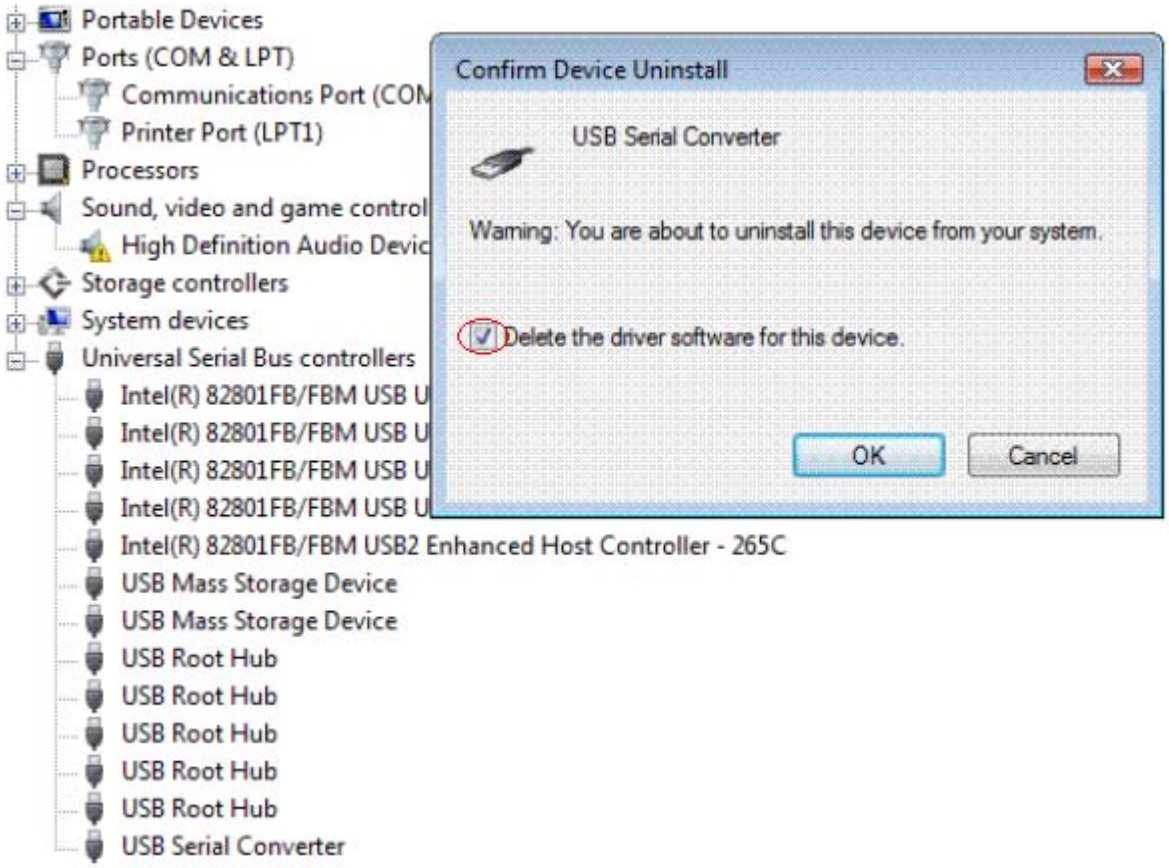

IEEE 1394 Bus host controllers
Keyboards
Mice and other pointing devices
Monitors
Network adapters
Portable Devices
Ports (COM & LPT)
Communications Port (COM
Printer Port (LPT1)
USB Serial Port (COM4)
Processors
Sound, video and game control
High Definition Audio Devic
Storage controllers
System devices
Universal Serial Bus controllers
Intel(R) 82801FB/FBM USB Universal Host Controller - 2658
Intel(R) 82801FB/FBM USB Universal Host Controller - 2659
Intel(R) 82801FB/FBM USB Universal Host Controller - 265A
Confirm Device Uninstall
USB Serial Port (COM4)
Warning: You are about to uninstall this device from your system.
Delete the driver software for this device.
OK
Cancel

Note: if you have more than one USB Serial Port (COMx) installed in your PC, you need to repeat from step 5 to step 6 to delete the driver software for each port.

7. **Locate your Device under the Universal Serial Bus Controllers section, and right click on it to bring up the menu shown.**


Storage controllers
System devices
Universal Serial Bus controllers
Intel(R) 82801FB/FBM USB Universal Host Controller - 2658
Intel(R) 82801FB/FBM USB Universal Host Controller - 2659
Intel(R) 82801FB/FBM USB Universal Host Controller - 265A
Intel(R) 82801FB/FBM USB Universal Host Controller - 265B
Intel(R) 82801FB/FBM USB2 Enhanced Host Controller - 265C
USB Mass Storage Device
USB Mass Storage Device
USB Root Hub
USB Root Hub
USB Root Hub
USB Root Hub
USB Root Hub
USB Serial Converter
Uninstalls the driver for t
Update Driver Software...
Disable
Uninstall
Scan for hardware changes
Properties

8. **Select uninstall and be sure to click the box for “Delete the driver software for this device” in the next window and press “OK”.**



Note: if you have more than one USB Serial Converter installed in your PC, you need to repeat step 7 and step 8 to delete the driver software for all devices.

RS-232 Signal Pin-outs of DB-9 Male (CN2)

Pin 1	DCD
Pin 2	RxD
Pin 3	TxD
Pin 4	DTR
Pin 5	GND
Pin 6	DSR
Pin 7	RTS
Pin 8	CTS
Pin 9	RI

RS-232 Signal Pin-outs of Terminal Block (TB1)

Pin 1	DCD
Pin 2	RxD
Pin 3	TxD
Pin 4	DTR
Pin 5	+5V
Pin 6	GND

RS-422 Signal Pin-outs of DB-9 Male (CN2)

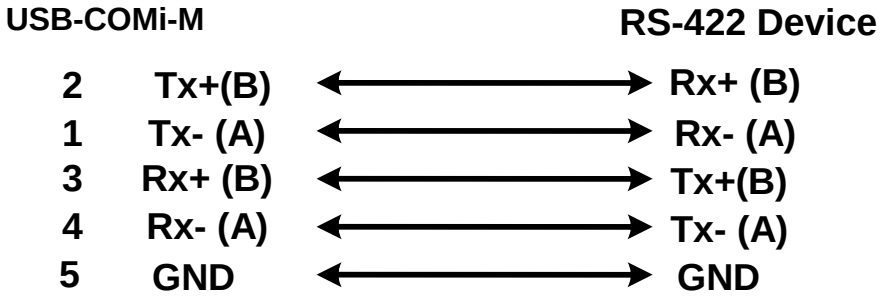
Pin 1	Tx- (A)
Pin 2	Tx+(B)
Pin 3	Rx+(B)
Pin 4	Rx- (A)
Pin 5	GND
Pin 6	RTS- (A)
Pin 7	RTS+(B)
Pin 8	CTS+(B)
Pin 9	CTS- (A)

RS-422 Signal Pin-outs of Terminal Block (TB1)

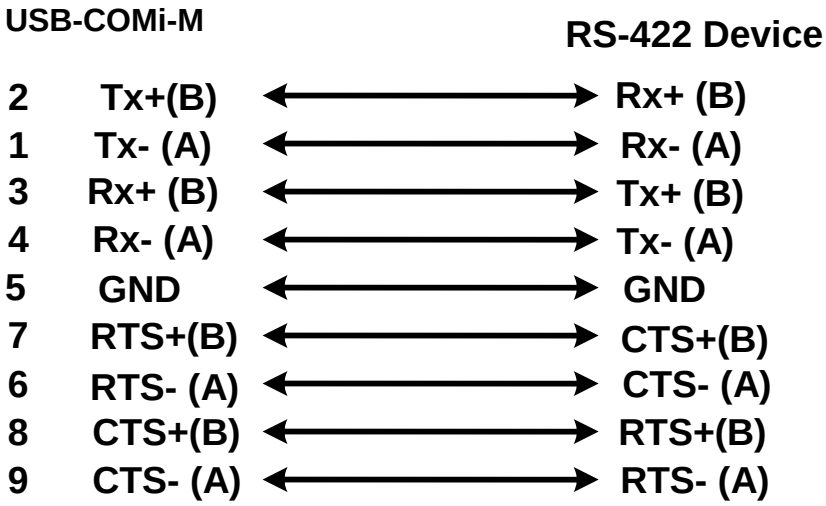
Pin 1	Tx- (A)
Pin 2	Tx+(B)
Pin 3	Rx+(B)
Pin 4	Rx-(A)
Pin 5	+5V
Pin 6	GND

RS-422 Signal Wiring

- **Point-to-Point 4 Wire Full Duplex**



- **RS-422 with Handshaking**



RS-485 4-Wire (Full duplex) Signal Pin-outs of DB-9 Male (CN2)

Pin 1	Tx- (A)
Pin 2	Tx+(B)
Pin 3	Rx+(B)
Pin 4	Rx-(A)
Pin 5	GND

RS-485 4-Wire (Full duplex) Signal Pin-outs of Terminal Block (TB1)

Pin 1	Tx- (A)
Pin 2	Tx+(B)
Pin 3	Rx+(B)
Pin 4	Rx-(A)
Pin 5	+5V
Pin 6	GND

RS-485 2-Wire (Half duplex) Signal Pin-outs of DB-9 Male (CN2)

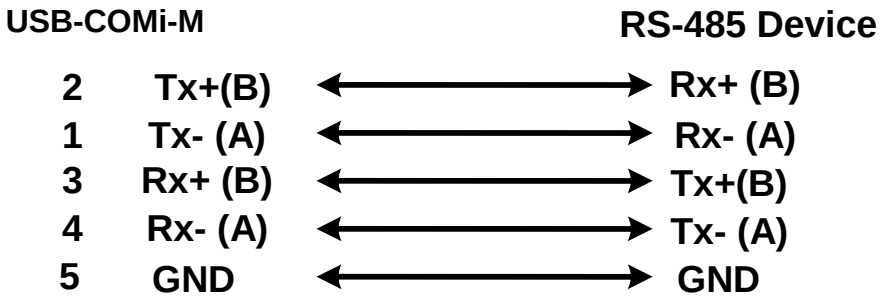
Pin 1	Data- (A)
Pin 2	Data+(B)
Pin 5	GND

RS-485 2-Wire (Half duplex) Signal Pin-outs of Terminal Block (TB1)

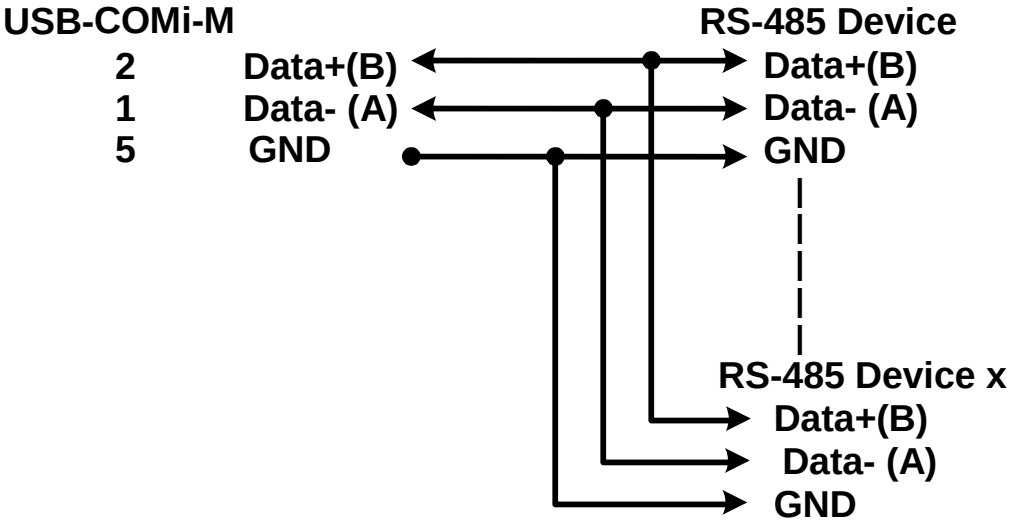
Pin 1	Data- (A)
Pin 2	Data+(B)
Pin 5	+5V
Pin 6	GND

RS-485 Signal Wiring

- **Point-to-Point 4 Wire Full Duplex**



- **Multidrop RS-485 2-Wire Half-duplex**



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Manual Part No. M054